



**STRENGTHENING BIODIVERSITY CONSERVATION  
AT KEY LANDSCAPE AREAS  
IN THE NORTHERN SUMATRA CORRIDOR**



## STRENGTHENING BIODIVERSITY CONSERVATION AT KEY LANDSCAPE AREAS IN THE NORTHERN SUMATRA CORRIDOR

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## PROJECT BACKGROUND

Sumatra is the third largest island in Indonesia, measuring 1,800 kilometers long and 400 kilometers wide. It contains an extraordinary wealth of natural resources and habitat diversity, which are crucial for maintaining the welfare of the Sumatran people. Sumatra is part of Southeast Asia's Sundaland biodiversity hotspot, recognized as one of the 25 richest and most threatened reservoirs of plant and animal life on Earth. Together these 25 biodiversity hotspots cover only 1.4 percent of the planet, yet contain roughly 60 percent of global terrestrial species diversity. Sumatra is home to more than 10,000 plant species, mostly in lowland forests, and it is the only place in the world where elephants, rhinoceros, tigers, clouded leopards and orangutans are all still found. 16 of Sumatra's 210 mammal species are unique to the island, including the Sumatran orangutan, Sumatran elephant, Sumatran rhinoceros and Sumatran tiger. In addition, the endemic primate diversity per unit area in Sumatra is unmatched anywhere else on Earth. Sumatra has 465 resident bird species, of which 14 are unique to the island. Birdlife International classifies 34 Important Bird Areas on Sumatra, 54% of which are outside protected areas.



Despite their biodiversity values, many of Sumatra's highly important species live outside protected areas.

60% of Sumatra's original forests have disappeared due to rapid unsustainable development, endangering most Sumatran wildlife.



Since 2002, Conservation International Indonesia has been carrying out a conservation program in Sumatra called the Northern Sumatra Biodiversity Corridor (NSC). The NSC encompasses a mosaic of the remaining quality forested areas in the lowlands, covering approximately 4.5 million hectares and stretching a few hundred kilometers long. The NSC includes the **Angkola Ecosystem**, the **Western Toba Watershed**, the **Leuser Ecosystem** and the **Seulawah Heritage Forest**. Approximately 70% of the remaining forest in the NSC is still intact. The NSC falls within two provinces: North Sumatra and Nanggroe Aceh Darussalam. The NSC's most popular flagship, endangered and umbrella species include Sumatran orangutans, Sumatran tigers, Sumatran elephants, Sumatran rhinos, and Malayan tapirs.

Most Sumatran wildlife is found in lowland forests, however, national and regional unsustainable rapid economic development has caused over 60% of Sumatra's original forests to disappear. The lowlands of Sumatra continue to decline at a fast rate, their degradation which started when commercial timber operation began to exploit the area at large-scale level in 1970. The situation became even more serious when large-scale palm oil plantations began operating in the 1980's. Conservation International's Sumatra-wide deforestation map from 1990 to 2005, showed an average forest decline rate of 2.5% per year, representing over 5 million hectares lost. The total forest area declined from 20.6 million ha in 1990 to 15.5 million ha in 2000. The largest forest loss by area occurred in Riau, almost 18 million ha in ten years. The lowest percentage losses in ten years were found in Aceh and

North Sumatra Province, with just over 8.4% and 12.6% forest loss (respectively), or nearly 588,000 ha in both provinces combined. As Sumatra and the NSC lose the lowland forests, they are also losing the extensive ecological services and natural wealth the forests provide. Millions of Sumatrans depend on these natural resources for their livelihood and basic needs, and could be the hardest hit by a growing shortage of resources.

The project site comprises of Batang Gadis National Park (BGNP), Batang Toru Forest Ecosystem (BTFE) and Dairi-Simpuatan Selatan Forest Land (DSFL) which includes both protection and production forests. The areas are under the administration of the Government of North Sumatra Province. BGNP is comprised of 108,000 hectares located in the Mandailing Natal Regency. BTFE encompasses 148,000 hectares, and is under the administration of the Governments of South Tapanuli, Central Tapanuli, Sibolga and North Tapanuli. The DSFL is located in Dairi Regency and Phapak Bharat Districts which cover a total of around 43,000 hectares.

The Northern Sumatra Biodiversity Corridor consists of extremely important watersheds and largely intact forest biomass that acts as storage for substantial quantities of carbon.



Batang Toru and Batang Gadis are two of the most important bulwarks for biodiversity conservation in the southern part of the Northern Sumatra biodiversity corridor. They equal the importance and nearly the size of Leuser in the north. Batang Toru hosts key populations of both the Sumatran orangutan and Sumatran tiger, while Batang Gadis is an important habitat and movement corridor for the tiger and a number of rare, smaller cat species. Both areas are extremely important watersheds and their largely intact forest biomass acts as storage for substantial quantities of carbon (see box). Conservation International's strategy is to safeguard these regionally important forest blocks (Key Biodiversity Areas) while working to maintain and improve the biological connectivity in the landscape between them for wide-ranging species such as the Sumatran tiger and Sumatran orangutan. With the identification of world's second largest lake, Lake Toba, as a freshwater Key Biodiversity Area (KBA) and Sicikeh-cikeh and Sidiangkat as a terrestrial KBA, the significance of conserving the remaining areas of protection forest, production forest, nature reserve and its watershed from coffee-based agricultural expansion has also increased.

**GITI Tires** consumes annually about 500-550 thousand metric tons of coal, or the equivalent of about 1 million tons of CO<sub>2</sub> or 270,000 metric tons of Carbon, emitted into the atmosphere. The Batang Toru forest covers about 150,000 hectares and the Batang Gadis National Park covers about 110,000 hectares, together they total around 260,000 hectares of mostly intact forest. Protecting these forest areas from conversion into vegetation with lower biomass (tree plantations or agriculture) conserves about 100 tons of Carbon per hectare, or 26 million tons of Carbon in total, which is equivalent to about 100 years of carbon emissions resulting from GITI Tire coal burning. This rough calculation does not consider the carbon benefits of improving the conservation of the Lake Toba watershed forest and those benefits accrued from reforestation of community land in the buffer zones of all three forest areas.

Conservation International aims at safeguarding the regionally important Key Biodiversity Areas in the Northern Sumatra Biodiversity Corridor.

## PROJECT GOALS & OUTCOMES

### 1. Goal

Strengthening biodiversity conservation in the Northern Sumatra Corridor through forest conservation and community based reforestation.

### 2. Outcomes

- Improve the conservation of protection forest in the Lake Toba Watershed.
- Stop agricultural encroachment into the West Batang Toru forest of South Tapanuli.
- Continue and expand the forest cover and biological monitoring of West Batang Toru (Sarula), and build conservation awareness in West Batang Toru with a focus on orangutan and tiger species.
- Secure the integrity of Batang Gadis National Park.
- Intensify surveys of conservation status and conservation awareness building for tiger species in Batang Gadis.





With the identification of Lake Toba as a freshwater Key Biodiversity Area, the significance of conserving the remaining forests and the watershed from coffee-based agricultural expansion has also increased.

As a result of the workshop for regional coffee farmers, Conservation Coffee Farmer Declaration was signed and both the Dairi Conservation Coffee Farmer Forum and the “Baperda Organik” Farmer Cooperative Institution were established.

## PROTECTION FOREST IN THE LAKE TOBA WATERSHED

In order to improve conservation of protection forest in the Lake Toba Watershed, Conservation International conducted a workshop for regional coffee farmers on how to successfully develop coffee agroforestry, grow organic coffee and use the protection forest sustainably. This workshop was held in Sidikalang, with around 200 participants from 10 sub-districts. As a result, the **Conservation Coffee Farmer Declaration** was signed and both the Dairi Conservation Coffee Farmer Forum and the “Baperda Organik” Farmer Cooperative Institution were established. Trainings emphasized on planting and growing coffee in the shaded areas of forest trees, and a nursery for coffee and shaded trees was established.

The residents of Perjuangan Village and the local government announced and signed an agreement to conserve the local community forest through three main initiatives:

- Promoting agro-forestry.
- Conducting community mapping.
- Using the resulting maps to obtain a community forest use permit for the locals.

This agreement helped to resolve an old conflict over land use in the Dairi District. The Dairi Conservation Coffee Farmer Forum has been pushing to get a community forest use permit from the Ministry of Forestry and the Head of the District, and with this agreement that seems likely.

In addition, a nursery was built by the community and trees produced by the nursery will be planted to create a live forest boundary. A Memorandum of Understanding between Conservation International and the Government of Dairi was negotiated and resulted in the creation of a document presenting supportive policies to maintain coffee-based land tenure and support conflict resolution in the protection and production forests, as well as to improve management of Key Biodiversity Areas and the development of conservation coffee production.



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The project site comprises of Batang Gadis National Park, Batang Toru Forest Ecosystem and Dairi-Simbuatan Selatan Forest Land, which includes both protection and production forests.



This total habitat covers of nearly 150,000 hectares and the Batang Gadis National Park, which covers about 110,000 hectares, provide in total 260,000 hectares of mostly intact forest. Conserving these forest areas from conversion into vegetation with lower biomass (tree plantations or agriculture) conserves about 50 t of C per hectare, or 13 million tons of C in total. This very rough calculation does not consider the carbon benefits of improving the conservation of the Lake Toba watershed forest and those accrued from reforestation of community land in the buffer zones of all three forest areas. The habitat is also a crucial watershed that regulates water to the surrounding areas. Also the landscape beauty is a huge potential for ecotourism development.

Located in the south of Lake Toba, Batang Toru holds at least 6 principal habitat types, covering approximately 148,000 ha.

## BATANG TORU FOREST RANGE

West and East Batang Toru Forest Range comprises an area in North Sumatra province south of Lake Toba. Roads separate West Batang from East Sarulla area. Batang Toru is a water catchment area that encompasses three regencies: North Tapanuli, Central Tapanuli, and South Tapanuli. Primary rain forest dominates the vegetation cover, which grows on steep hillsides with more than a 60-degree slope. Batang Toru holds at least six principal habitat types including moss forest (above 620 m), hillside moist forest (dominant between 200-600 m), lowland, cliffs and talus slopes, secondary forest, and riparian forest. Total extant habitat covers approximately 148,000 ha.

Increasing pressures on forest resources and habitats, including loss and degradation of habitat through land clearing, threaten the remaining Batang Toru forest. In addition, this area includes Batang Gadis, Batang Toru and Western Lake Toba, the convergence point of southern and northern bio-geographical assemblages, i.e., where distributions of species such as orangutan, mitered leaf-monkeys (*Presbytis melalophos*), Malayan tapir (*Tapirus indicus*), Sumatran serow (*Capricornis sumatraensis sumatraensis*) and *Rafflesia gadutensis* overlap. In addition to the Sumatran orangutan, a second Critically Endangered species occurs in this area, the Sumatran tiger (*Panthera tigris sumatraensis*). Sumatran orangutans and tigers are the focus of intensive international conservation efforts, with both species facing extinction within the next decades if immediate conservation interventions are not successful.

## BIODIVERSITY VALUE OF BATANG TORU

Furthermore, the Batang Toru Rapid Assessment Program (RAP) team conducted by Conservation International in 2005 revealed that Batang Toru Forest Range has a unique and high biodiversity value (Table 1). Biodiversity results presented in the Table include the IUCN and CITES criterion. Although it is not directly related to orangutan protection, these findings are extremely important since it demonstrates that the areas of Batang Toru Forest is rich in biodiversity, including multiple restricted range and/or threatened species.



Rapid Assessment Program team revealed in 2005 that Batang Toru Forest Range has a unique and high biodiversity value.

The iconic orangutan is one of Sumatra's endemic and highly threatened primates.

**Table 1.** List of Species Identified during RAP Surveys in West Batang Toru



Class	Σ Species	IUCN			CITES		Sumatran Endemic Species
		CE	E	VU	APP. I	APP. II	
Mammalian	41	2	1	4	6	5	2
Aves	233	0	0	2	1	10	20
Amphibian	45	0	0	1	0	0	4
Reptilian	36	0	0	0	0	2	0
Vegetation	414						
Nepenthes sp.	11	2	0	0	0	0	1

**Note:**

CE (*critically endangered*), E (*endangered*), VU (*vulnerable*), App (*most concerned*).



Integrating economic development into both social and ecological development is needed in Batang Toru.

A study by Conservation International revealed that the total economic value of natural resources in Batang Toru area was estimated to be USD400 millions. Assuming that the interest rate is 10%, the Net Present Values is about USD4 billions.

## ECONOMIC VALUE OF BATANG TORU

In general, the Conservation International study revealed that the total economic value of natural resources in Batang Toru area was estimated to be IDR3.6 billion (approximately equal to USD400 millions at IDR9,000 per USD1) per annum. Assuming that the interest rate is 10%, the Net Present Value is about USD4 billions. This figure was resulted from both the inseparable use and non-use values. It also found that the local economic development tended to focus merely on economic growth regardless

the needs for integrating economic development into both social and ecological development, about which such integration has been globally promoted through the sustainable development principles. Based upon this study, a number of recommendation were proposed for consideration at the local levels, such as natural resource accounting, promotion of community-based economic activities, and development of a participatory sustainable development strategy.

## THREATS & CHALLENGES IN BATANG TORU

Threats on Batang Toru forest were determined using a GIS analysis which resulted in a prognostic map of future orangutan habitat loss patterns in Batang Toru and surrounding areas. This analysis could help identify the relative vulnerability of different habitats to degradation and human activity. A total of 6.34 km<sup>2</sup> of forest was cleared between 1990-20000 in Batang Toru area, equivalent to an average deforestation rate of 0.05% per year.

The analysis indicated that most of all forests in the West Batang Toru area are facing high deforestation threat, so the orangutan population in this area has been under high pressure as well. In addition, since the area is surrounded by provincial and reGENCY level roads, new settlements are continued to appear upward penetrating the forest, making the prediction very possible to occur in the near future. Disturbance to orangutan habitat made by human in the area, through forest conversion to agriculture and plantation areas, either legal or illegal, logging and gold mining activities, has occurred as well.

Protecting the remaining orangutan population thus has been the top priority at the global and national levels. The responsibility of local governments has been explicitly addressed in the Act No. 33/2004, stating that the local government is obligated to converse the natural resources, including the biodiversity and its ecosystem, while business actors should incorporate the same obligation in the good corporate governance scheme that demands business sectors to be involved in conserving nature through their corporate social responsibility mechanism.

Reviews on the government's policies, series of workshops, and regular consultations with both local government and business sectors have identified a discrepancy between the need for Batang Toru Forest conservation and that of economic develop-

ment. One important proposition was the requirement to replenish the government's policies on the management of natural forests in Batang Toru. Another proposition was the necessity to develop priority strategies for the protection of natural forests in the Batang Toru watershed area that function as the life supporting system, as well as orangutan habitat.

Policy replenishment should prioritize reviews on land management in the forested areas of Batang Toru, where a number of aspects should be taken into account. One important aspect has been the status and function of forested areas. Ideally, there should be a cohesive commitment to transform the existing forest functions into 'protected areas' where logging concession areas, limited production forest areas, and nature reserves in the areas are combined into a 'national park' for the fact that those areas are orangutan's habitat. However, a status of national park might not be the only choice, other options need indeed to be explored. Once all stakeholders in the areas could agree on the need to manage forests sustainably, which reserves the importance of wildlife conservation (e.g. orangutan and tiger), a feasible option would be to develop a management body that accommodates all districts' objectives in achieving the regional sustainable development.

An integrated management body is needed to consider the needs to deal with forest functions as the source of energy (via water supply for both hydro-electricity and geothermal powers), the main source of water supply for daily local livelihood (via sustainable agriculture development), the agents for soil fertility maintenance and climatic equilibrium.

Habitat degradation and human activity in Batang Toru area had led to an average deforestation rate of 0.05% per year (1990-2000).

Once all stakeholders in the areas could agree on the need to manage forests sustainably, which reserves the importance of wildlife conservation (e.g. orangutan and tiger), a feasible option would be to develop a management body that accommodates all districts' objectives in achieving the regional sustainable development.



## CONSERVATION INTERNATIONAL IN WEST BATANG TORU

While Batang Toru is a new site for Conservation International, we are firmly committed to working in the area. Our activities to-date in North Sumatra provide a solid foundation upon which the work reported here was based. We believe that through Conservation International's past work in the Northern Sumatra areas, we have learned so much about the complexity, challenges, and opportunities we face in developing and implementing effective conservation solutions. Based on Conservation International experience, the following chosen activities have helped reduce the current barriers to conservation, i.e. the absence of a conservation plan, insufficient capacity among local stakeholders to manage conservation efforts, lack of capacity and incentives to pursue sustainable agroforestry or other economically viable conservation-friendly businesses. Gathering accurate information on species distribution and habitat requirements, and the sharing of this knowledge with stakeholders are essential for designing and applying appropriate conservation interventions.

### 1. Catalyzing Improved Protection of Orangutan Habitat

Several objectives enclose these activities. First, we are working with partners to map orangutan distribution and habitat, and formulate a strategy to improve protection. These activities include finding sustainable economic activities to enhance alternative income earning opportunities for local communities. These alternatives must provide a sufficient incentive to offset benefits derived from poaching and illegal logging. **If their immediate economic and income needs can be met, then local communities are far more likely to be receptive to conservation efforts.**

Second, strategic interventions to support key stakeholders for promoting the protection of the development and tested orangutan population. In the second activities, Conservation International succeeded in developing **Orangutan Protection Unit (OPU)**, alliances of local community, private sector, government, and NGOs to monitor and enforce a protection system for orangutans in Batang Toru.

Thirdly, we must protect the Orangutan habitat and get protected forest or conservation area status. Conservation International provides technical support to get all information needed and developed proposal for the Mayor of South Tapanuli District. The proposal is to change the production forest to conservation area with the legal status of Grand Forest Park (*TAHURA*). The proposal to request recommendation has already been

Conservation International succeeded in developing Orangutan Protection Unit, alliances of local community, private sector, government and NGOs to monitor and enforce a protection system for orangutans in Batang Toru.



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submitted to the Governor of North Sumatra and will later be submitted to the Ministry of Forestry.

### 2. Developing Sustainable Economic Alternatives for Local Communities in Batang Toru

In these activities, Conservation International collaborate with ICRAF, local NGOs and business enterprises to monitor essential indicators and to adjust our actions as needed to maintain progress. We believe that the rubber agroforests of Batang Toru and surrounding areas can provide sustainable livelihood options with opportunities to increase farmers' income without negative environmental impact, and minimize community pressure to the forest.

Conservation International used this process as another tool to build the capacity of our partners, helping them to build both sustainable and adaptive approaches to fostering conservation. ICRAF used rubber agroforest to increase local community income through seedling, harvesting, post-harvest handling techniques, and marketing of agricultural products.

By choosing three villages (Sitandiang, Aek Nabara and Sibulan-bulan) as models, ICRAF and Conservation International established farmer groups to increase their knowledge at rubber agroforest.

Conservation International believes that by continuing to work with local communities to increase knowledge about orangutans and the forests where they live, working to reduce further habitat loss, and monitoring and conserving current orangutan population, we can save this magnificent species from extinction.

Providing sustainable livelihood options has minimized negative environmental impact and community pressure to the forest.







Illegal logging remains a serious threat to the Batang Toru Forest Range.

A joint task force with North Sumatra NGOs (NGOs Alliance for North Sumatra Spatial Planning) was also established for the North Sumatra Spatial Revision and the Ministerial Decree Revision, regarding forest status in North Sumatra Province. This effort will influence and enforce forest status changes in the Batang Toru Forest block and will make this status change more compatible with conservation and regional sustainable development. Three government districts including South Tapanuli, Central Aceh and North Tapanuli, have already proposed to change protected forest area status to production forest status. These changes in forest status accommodate a Key Biodiversity Area in North Sumatra Province. This alternative concept will be presented to the Minister of Forestry.

Furthermore, the Sumatra central government and Sumatra Spatial Planning Alliance have involved Conservation International in developing a Presidential Decree to address ecosystem-based, Sumatra-wide, spatial planning. This effort will influence and enforce a forest status change in the Batang Toru Forest block, making it more compatible with conservation development and regional sustainable development.

## STOPPING AGRICULTURAL ENCROACHMENT

Several milestones have been recorded in the attempt to stop agricultural encroachment into the West Batang Toru Forest in South Tapanuli. On December 11, 2008, the North Tapanuli District and Conservation International signed a **Memorandum of Understanding** (MoU) concerning conservation and sustainable use of Key Biodiversity Areas in South Tapanuli (Batang Toru Forest and Siondop-Angkola Peat Swamp Forest). The South Tapanuli Government agreed to release a local decree to conserve the forest through forest status jurisdiction and to change the Grand Forest Park status to conservation area.



Changes in forest status have been proposed to accommodate a Key Biodiversity Area in North Sumatra.



A community-based decree to conserve village natural resources was also signed by villagers in Aek Nabara.

Forest status change in the Batang Toru Forest block is expected to make it more compatible with conservation development and regional sustainable development.

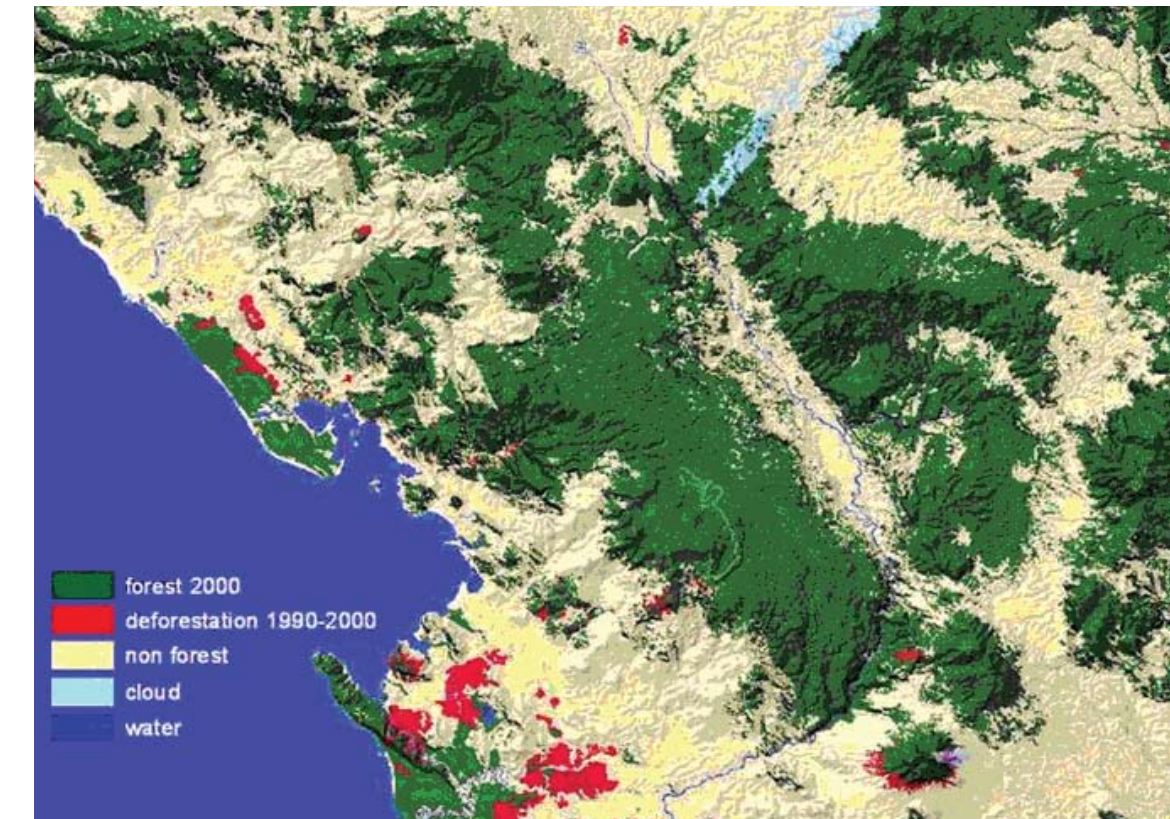
Additionally, a **Village Head Decree** initiated a community-led taskforce to conserve village natural resources was also discussed and signed by the local community in Aek Nabara Village in the Batang Toru Forest block. This decree will increase habitat protection of the Sumatran orangutan and its habitat in the South Tapanuli District through local efforts.

Conservation International also assisted with a small grant to the Aek Nabara Village community for a small-scale public water channel rehabilitation project which was damaged by a recent earthquake. The construction work is now complete. Moreover, on-site scale assessments for rubber agro-forestry development were conducted and details of the rubber supply chain were documented.

## FOREST COVER MONITORING

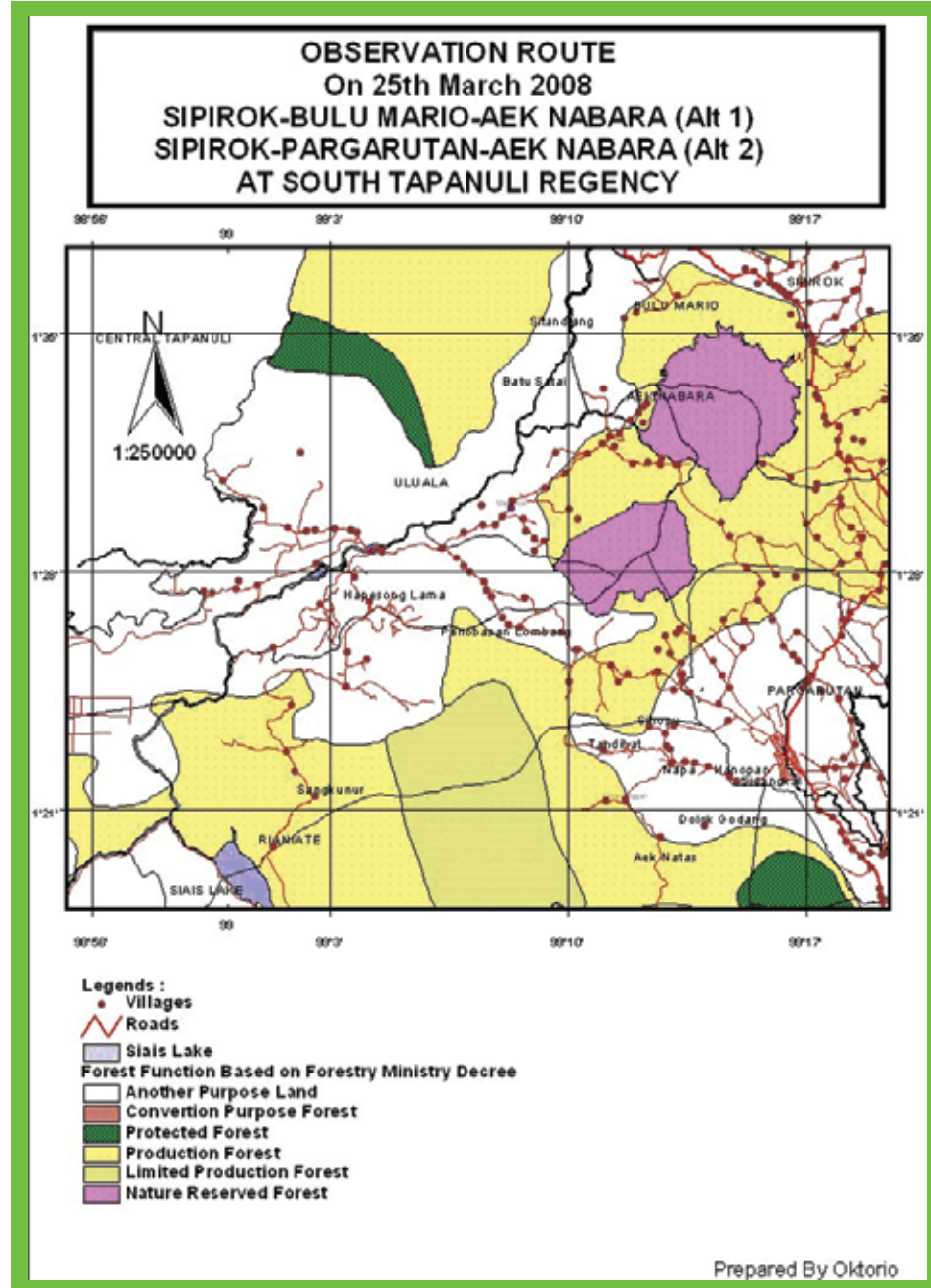
Conservation International continues and expands the forest cover and biological monitoring of West Batang Toru (Sarula), and build conservation awareness in West Batang Toru with a focus on orangutan and tiger species. An education team for awareness activity was created and a KBA survey was conducted in three districts, supported by a local library. Conservation International also held a discussion with the Aek Nabara community to develop a conservation information center.

Forest cover monitoring for the Batang Toru forest block was conducted and a deforestation map was produced.



Conservation International found that the rate of forest loss increased to 197 ha per year from 2000 to 2007.

Forest cover monitoring for the Batang Toru forest block was conducted and a deforestation map was produced. The primary and secondary forest classifications were referenced from a mosaic of Spot 4 imagery acquired in 2006. A remote sensing analysis was performed using ASTERR (Advanced Space-borne Thermal Emission and Reflection Radiometer) imagery, at a resolution of 15 meters, which was then compared to a Landsat 5 baseline of forest cover from the year 2000 to assure the most precise data on forest land cover changes. In the Batang Toru area, from 2000 to 2007 the forest recorded a loss of 1,382 Ha from a total area of 168,881 Ha, or greater than 0.1% per-year. Meanwhile, from 1990 to 2000, Batang Toru lost 880 Ha, at a rate of 88 Ha per year. The rate of forest loss increased to 197 Ha per year from 2000 to 2007.



Conservation International continues monitoring and builds conservation awareness in West Batang Toru.

In the Batang Toru area, from 2000 to 2007 the forest recorded a loss of 1,382 Ha from a total area of 168,881 Ha, or greater than 0.1% per-year. Meanwhile, from 1990 to 2000, Batang Toru lost 880 Ha, at a rate of 88 Ha per year. The rate of forest loss increased to 197 Ha per year from 2000 to 2007.

## SUMATRAN TIGER

The island of Sumatra is home to one of the most threatened subspecies of tigers surviving in the wild: *Panthera tigris sumatrae*. Numbers of tigers in Sumatra are believed to have been constantly declining over the last decades. The decline is owing to habitat loss, poaching, and retaliation killings. Sumatran forests, the main habitat for the tiger, have continually been converted to large-scale industrial and agricultural plantations; mainly oil palm and acacia trees. Meanwhile, tigers are poached for the international wildlife trade and are often captured after coming into conflict with people. At present, the estimated number of Sumatran tigers in the wild is only around 100 to 300. An extremely low number that has earned the tigers the status of Critically Endangered.

In addition to using familiar field techniques, such as interviews and ad-hoc surveys to document tiger presence, Conservation International installed five camera traps in the Sibuali-buali Nature Reserve, in the South Tapanuli District. Some endangered species were captured on

Numbers of tigers in Sumatra have been constantly declining due to habitat loss, poaching and retaliation killings.



Several sightings of the highly endangered Sumatran tiger have been recorded in Batang Gadis National Park.



Conservation International has installed five camera traps to determine the presence or absence of tigers.

film, including the Serow (*Capricornis sumatrensis*), Asiatic golden cat (*Pardofelis temminckii*), Linsang (*Asiatic linsang*), porcupine and macaque. Until the time this report was written, no tigers were captured by the camera traps.

Five camera traps have also been installed and started operating in the Sopotinjak Area of Batang Gadis National Park. Several sightings have been recorded in Batang Gadis so far. In this initial stage, camera trapping was used to simply determine the presence or absence of tigers in these areas. However, in the future, the method can also be used to reveal ecological characteristics of tigers, because camera trapping is quite effective

to estimate tigers' relative abundance and predict the occurrences of tigers and their prey. The result, consequently, can help the team determine the necessary core areas of tigers and their prey to be recommended for monitoring and protection.

Conservation International has also established a "Green Tent" or a conservation tent, decorated with conservation posters, where regular counseling, trainings, workshops and film screening are conducted for the surrounding communities and regional decision makers. These activities are aimed to increase awareness of local communities and decision makers, as well as to increase stakeholders' support and the effectiveness of enforcement efforts.

At present, the estimated number of Sumatran tigers in the wild is only around 100 to 300. An extremely low number that has earned the tigers the status of Critically Endangered.



Many habitats of tigers and orangutans have been lost and converted to large-scale plantations.



The extremely low number of orangutans in West Batang Toru (approximately 400 individuals) has awakened Conservation International concern to work in this area and to save the last orangutan habitat in North Sumatra Province.



Without effective and immediate intervention, orangutans could become functionally extinct within the next 10 years.



Disappearance of orangutans could lead to the loss of many other species of plants and animals within the ecosystem.

## SUMATRAN ORANGUTAN

The Sumatran orangutan's primary habitat is located in the lowlands of the Leuser Ecosystem Area in the provinces of Nangroe Aceh Darussalam and North Sumatra, Indonesia. The Sumatran orangutans' population is now estimated at 7,300 individuals. Estimated population in West Batang Toru, North Sumatera is approximately 400 individuals. This fact awakens Conservation International concern to work in this area to save the last orangutan habitat in North Sumatra.

Orangutans are “keystone” species for conservation as they play an important part in forest regeneration through the fruits they eat and seeds they disperse.

Because of this precipitous decline, without effective and immediate intervention, the species could become functionally extinct within the next ten years. And, because **orangutans are “keystone” species for conservation as they play an important part in forest regeneration through the fruits they eat and seeds they disperse** – their disappearance could also lead to the loss of many other species of plants and animals within that ecosystem.

Conservation International has identified several orangutan habitats in Batang Toru.



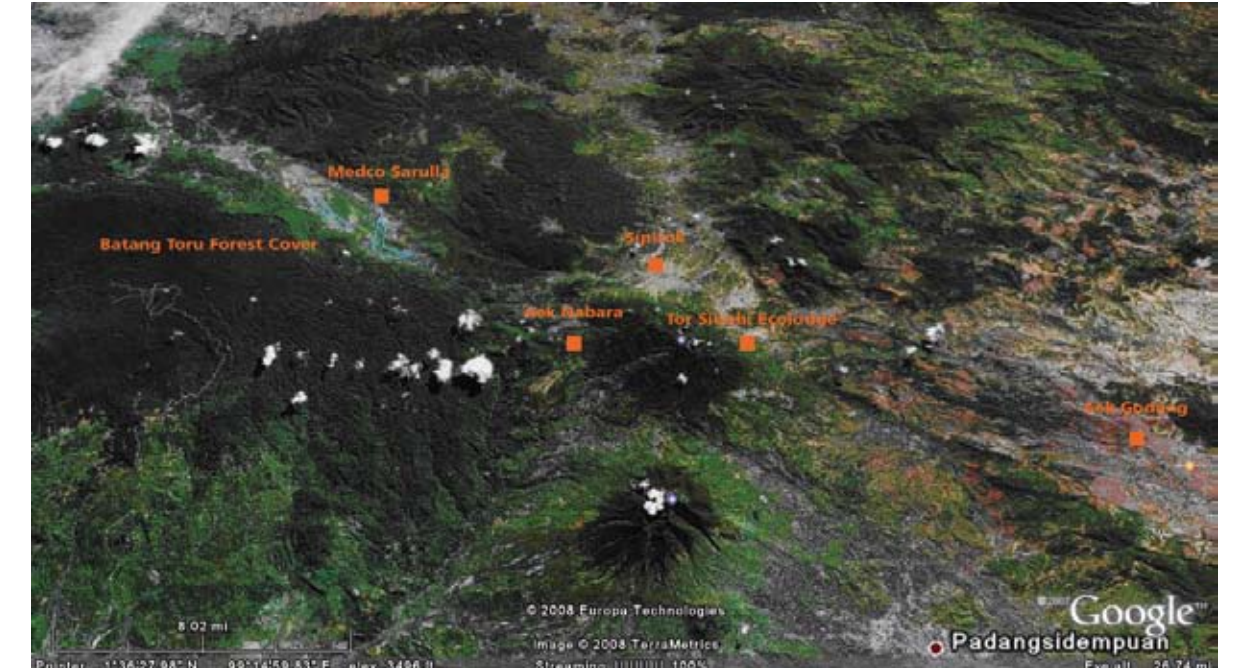
## US AMBASSADOR VISIT

The US Ambassador to Indonesia, Cameron R. Hume, visited the Batang Toru Watershed Areas on March 25, 2008. He was accompanied by Thomas Friedman, a celebrated author and columnist for the New York Times. Also escorting the Ambassador were Glen Prickets, Conservation International Vice President for Conservation and Environmental Leadership and Business (CELB) and Arifin Panigoro of Medco Corporation who sits on the Conservation International Indonesia Advisory Board.

The US Ambassador to Indonesia lovingly held a recently rescued baby orangutan in Aek Nabara.



The Ambassador was impressed by the agroforestry system that the villagers had implemented.



The Ambassador and his group also took to the skies for an aerial view of the orangutan habitat in Batang Toru.

The group arrived at Aek Nabara Village, and had an informal dialogue with members of the community who shared their interests and acknowledged the efforts of Conservation International in preserving their forest and building their understanding of the life-cycle of the orangutan and its habitat.

They also exhibited their agroforestry products including nutmeg, cinnamon, coffee, rubber, and cocoa. The Ambassador was impressed by the agroforestry system that the villagers

had implemented. The community has successfully planted durian, cocoa, salacca, cinnamon, coffee, and all types of seasonal tropical fruits, including rambutan and mangoes. The agroforestry system was adopted because of its positive impact on the peripheral areas of orangutan habitat, while at the same time it preserves the agricultural heritage of the community.

The Ambassador and the group later took to the skies for an aerial view of the orangutan habitat in Batang Toru, South Tapanuli, North Sumatra.



Conservation International aims at securing the integrity of Batang Gadis National Park.



Local communities were actively involved in discussion sessions to determine conservation activities in and around the Park.



Discussions also took place between the central and district government officials to converse and negotiate various details.

## BATANG GADIS NATIONAL PARK

In addition to the Batang Toru area, Conservation International also aims at securing the integrity of the Batang Gadis National Park. To achieve this, Conservation International has fostered discussion sessions between the central government and district government officials to converse and negotiate the issues and details of the Batang Gadis National Park boundaries with local communities. Following the discussion, a park boundary agreement was written up along with a map, and it was signed by the head of the village. The first phase of temporary boundary demarcation was constructed in 2007. The initial phase resulted in a boundary 100 kilometers long, and this will be extended another 100 kilometers during the second phase in 2009.

The first phase of temporary boundary demarcation of Batang Gadis National Park was constructed in 2007. The initial phase resulted in a boundary 100 kilometers long, and this will be extended another 100 kilometers during the second phase in 2009.



Batang Gadis National Park also serves as one of the most crucial watersheds in North Sumatra.

## FOREST UTILIZATION INVENTORY IN SIHAYO FOREST BLOCK

Conservation International has also discovered that forest degradation and increased population around the forests in Mandailing Natal Regency has reached an alarming level. The people of Nias origin in Sihayo Forest Block and its surrounding, which has earned a status as a protected forest, and also around Batang Gadis National Park, have caused problems, specifically the clearing of approximately 2,000 ha of forests.

Illegal logging and land conversion into residences by the Nias people have also caused resentment and social conflicts among other inhabitants around the forest. Therefore, Conservation International inventoried the extent of forest conversion into plantations and areas of residence by the Nias ethnicity in Sihayo Forest Block.

A collaborative team was established to do the inventory, with members representing the local government, Conservation International, local law enforcement, and volunteers from four villages, which are Hutagodang Muda Village, Muara Batang Angkola Village, Tanggabosi Village, and Tanjung Sialang Village.

Based on the inventory, the following results were collected:

- Nias people migrated to Sihayo because the small island where they came from is overpopulated, its lands are no longer fertile, and work is hard to find. Some are also encouraged to move by their relatives or friends in Sihayo.
- Nias ethnicity in Sihayo prefers to live in isolation, coming out only once a week on Market Day, making government socialization / realization programs on population control hard to reach them.

- All Nias people in Sihayo and its surrounding work in plantations, namely cocoa, rubber, pecan, *nilam* and chilies. *Nilam* currently is economically highest in value.

- Other inhabitants around the area are aware of the law and regulations concerning land conversion in protected forests and they have grown more disgruntled to see the newcomers from Nias could easily clear forests and no action has been taken by local law enforcers. This delicate situation, if not handled properly, can turn into serious conflicts between different ethnicities and religions.

- Nias people currently utilize 340.75 ha of land within the boundaries of protected forests and 173.5 ha inside Batang Gadis National Park, totaling an area of 504.25 ha.

- Based on questionnaires, most of the Nias people gained the lands by directly clearing the forests themselves, without obtaining permission from anyone. Some illegally bought the lands, while a small percentage received their lands from relatives as gifts or inheritance.

Conclusively, a land tenure conflict regarding Nias illegal settlers inside Batang Gadis National Park was discussed and negotiated among the district government and the national park agency to come to a compromise and a participatory conflict resolution. A temporary alternative solution was found for the illegal settlers through a government-owned community planted forest scheme in the Bukit Malintang Sub-district. The Illegal settlers' inventory was conducted and 180 households interviewed. An anthropology assessment was also planned to find the best solution for the involuntary and managed translocation of these illegal settlers.



Conservation International inventoried the extent of forest utilization by Nias ethnicity in Sihayo Forest Block.

The results of this activity will be used to further address the complexity of the problems facing Sihayo Forest Block and the surrounding areas. Firm actions must be taken transparently among all inhabitants, aimed at resolving conflicts and finding fair solutions for all inhabitants in and around the forest block. Alternative livelihood programs must also be implemented, as well as installations of visible signage indicating the existence and boundaries of protected forests.

Forest degradation and increased population around the forests in the Mandailing Natal Regency has reached an alarming level. The result of the Forest Utilization Inventory will be used to further address the complexity of the problems facing Sihayo Forest Block and the surrounding areas.

Stakeholders agreed that a community-based natural resources management is the most realistic option.

## CONFLICT MANAGEMENT IN TOR SIHAYO

Theoretically, it is important to identify the four types of conflicts that may rise within a community: (1) disputes; (2) non-violent confrontations; (3) escalation towards violence; and (4) overt violence. Based on characteristics of these conflicts, phase 1 and 2 can be prevented, while phase 3 and 4 must typically go through mediation and conflict mitigation processes. Using this theoretical frame, Conservation International discovered that conflicts in Tor Sihayo are still in phase 1 (disputes), but with serious potentials to develop into phase 2.

Several alternatives have been discussed with all stakeholders, which in the end, have narrowed down to one realistic option, i.e. freeing Batang Gadis National Park from settlements, plantations and other utilization, and collaboratively managing other protected forests around it. Realistically, the National Park must be freed from any illegal utilization and management. However, the forests around the boundaries of the Park may still be utilized under strict regulations and management of a collaborative body. As a result, a new scheme was born, which is a **community-based natural resources management**.



The forests around the boundaries of the Park may still be utilized under strict regulations and management of a collaborative body. As a result, a new scheme was born, which is a community-based natural resources management.

The scheme shows that social capital is also an essential part of natural resources management.

In addition to physical, material and financial capital, the scheme shows that social capital is also an essential part of sound natural resources management. All relevant social components are involved in this social network where they must be able to work together based on trust. This trust is guaranteed through willingness to comply with all rules and regulations that have been agreed upon by the majority.

## AGROFORESTRY AROUND BATANG TORU & BATANG GADIS

The communities residing around Batang Toru Forest Range and Batang Gadis National Park make their living as farmers. Conservation International therefore explored agroforestry as a sustainable option for the villagers. Agroforestry is a land utilization technique of combining forest trees with other plants that have economic values, in a traditional way, through which conservation and economic necessities can both be fulfilled. The goal of agroforestry is to boost farmers' welfare by fostering their active participation in natural resources management. The end result should increase their productivity and ensure sustainability of natural resources, which in turn will improve their living standards.

Two stages of agroforestry development are:

- 1. Workflow**  
Activities include village assessment, analysis and action, workshops, facilitation, and evaluation monitoring.
- 2. Approach**  
Interaction with farmers in order to build trusting relationships with them, as well as knowledge sharing and capacity building.

As the result of this initial stage, farmers now regularly get together to discuss problems that they face in managing their lands and plantation. This discussion typically continues with determining the necessary actions and activities, which will be executed based on a scale of priority, giving a very encouraging start of a full-blown development of agroforestry in the area.

**Tanjung Rompa Village** in particular, turns out to have advanced knowledge on agroforestry. The villages have long practiced agroforestry in the form of traditional farming system, which was developed and tested by them based on current conditions and necessities or based on market demands. This knowledge has been passed on from one generation to the next for many years.

The main commodities from Tanjung Rompa Village are rubber, coffee and cinnamon. The rubber from this village is in demand due to its high quality. Coffee production has also been abundant, as well as cinnamon. However, due to a shift in socio-cultural values, the farmers in Tanjung Rompa now also plant *salak*, cocoa, and sugar palm. So one area of plantation in Tanjung Rompa can consist of several commodities.

Tanjung Rompa Village turns out to have advanced knowledge on agroforestry and has long practiced it in the form of traditional farming system, which was developed and tested based on current conditions and necessities or based on market demands. The knowledge has been passed on from one generation to the next for many years.



Agroforestry is a land utilization technique of combining forest trees with other plants that have economic values, through which both conservation and economic necessities can be fulfilled.

Agroforestry system in Tanjung Rompa will be developed further into plantations that are no longer nomadic, filled with various commodities, and managed according to farming patterns in a forest ecosystem. Cocoa is highly recommended as their main commodity. Cocoa tends to be 'friendly' with previously planted lands and can adapt easily with other plants. The people of Tanjung Rompa have also expressed their interests and willingness to manage their lands properly into a more productive source of income.





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